

## MISCELANEOUS NOTES ON ANTILLEAN MOSSES, 2. RHAPHIDOSTICHUM (SEMATOPHYLLACEAE) IN THE NEW WORLD

William R. Buck

Buck, William R. (New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.). Miscellaneous notes on Antillean mosses, 2. *Rhaphidostichum* (Sematophyllaceae) in the New World. *Moscosa* 5: 189-193. 1989. *Rhaphidostichum* is reviewed for the New World and two species are recognized, *R. schwaneckeanum* (C. Müll.) Broth. and *R. acrostegium* (Sull.) Buck, comb. nov. Both are described. *Rhaphidostichum guianense* Bartr. is synonymized with *Sematophyllum galipense* (C. Müll.) Mitt. and *R. gunckelii* Thér. is treated as *Sematophyllum gunckelii* (Thér.) Buck, comb. nov.

*Rhaphidostichum* es revisado para el Mundo Nuevo y dos especies están reconocidas, *R. schwaneckeanum* (C. Müll.) Broth. y *R. acrostegium* (Sull.) Buck, comb. nov. Los dos están descritos. *Rhaphidostegium guianense* Bartr. es un sinónimo de *Sematophyllum galipense* (C. Müll.) Mitt. y *R. gunckelii* Thér. es tratado como *Sematophyllum gunckelii* (Thér.) Buck, comb. nov.

*Rhaphidostichum* is primarily an Asian genus of Sematophyllaceae with only two species in the New World, both West Indian endemics. The genus is characterized by essentially oblong leaves with abruptly tapered, strap-shaped (loriform), serrate apices. The leaf cells are linear, smooth, and very incrassate. The alar cells are greatly enlarged, often in subauriculate areas, the outer ones mostly curved. The seta is often roughened above; the exothecial cells are collenchymatous; the exostome teeth have either a zig-zag center line or a narrow furrow.

In the strict sense *Rhaphidostichum* seems most closely related to *Acroporium* because of the subauriculate, curved alar cells and a tendency toward furrowed exostome teeth. However, *Acroporium* differs in gradually tapered, concave leaves and cuspidate branches. When the genus was described (Fleischer, 1923), the section *Papillidiopsis* was included in the genus to accommodate those species without a loriform leaf apex, mostly unipapillose leaf cells, and alar cells not curved. This section is being removed from the genus (Buck & Tan, in prep.).

In the New World *Rhaphidostichum* has been little used, and then usually incorrectly so. Three species currently reside in the genus, *R. guianense* Bartr., *R. gunckelii* Thér. and *R. schwaneckeanum* (C. Müll.) Broth. The first two of these belong in *Sematophyllum* and are treated at the end of this paper. *Rhaphidostichum schwaneckeanum*, a West Indian endemic, on the other hand, truly belongs in the genus and is very similar to some of the Asian/Oceania species. In addition, another Antillean species never previously placed in the genus belongs there. *Rhaphidostichum* and its two American

species are described below. *Rhaphidostichum* is added to the short list of genera of primarily Asiatic provenance with outliers in the Antilles or the northern Andes (cf. Buck, 1987).

*Rhaphidostichum* Fleisch., Musci Fl. Buitenzorg 4: 1307. 1923.

*Hypnum* sect. *Chaetomitrella* C. Müll., Bot. Jahrb. 5:85. 1983 [see also Forschungsreise Gazelle (Bot.) 4: 48. 1989].

Rather robust plants in dense, mostly glossy, usually golden mats. Stems creeping, freely but irregularly branched; branches erect or ascending, often  $\pm$  turgid; pseudoparaphyllia foliose. Leaves erect to erect-spreading, abruptly constricted from an ovate to oblong, concave base to a long, slender, serrate, often  $\pm$  parallel-sided, plane or twisted acumen; margins plane, serrate above, entire to serrulate below; costa short and double or absent; cells linear to linear-flexuose, smooth, very incrassate, often with the lumina narrower than the walls, porose; alar cells greatly enlarged, inflated, often in subauriculate areas, oblong, the outer ones often curved, often colored, at least at the base of the costa. Autoicous or dioicous. Perichaetial leaves erect, mostly lanceolate; margins serrate; cells thick-walled, porose, smooth. Setae elongate, reddish, often roughened above; capsules inclined to nodding, small, ovoid to short-cylindric, asymmetric, sometimes with a roughened neck; exothecial cells collenchymatous; annulus none; operculum obliquely long-rostrate; peristome double, exostome teeth on front surface with a zig-zag center line or a median furrow, cross-striolate below, coarsely papillose above, projecting at back; endostome with a high basal membrane, segments keeled, perforate, cilia 1–2, well developed. Spores medium-sized to large, papillose. Calyptrae cucullate, smooth, naked.

#### Key to the American species of *Rhaphidostichum*

1. Plants slender, autoicous; alar cells  $\pm$  oval. . . . . *R. aceastrostegium* (1)  
 1. Plants  $\pm$  robust, dioicous; alar cells oblong . . . . . *R. schwaneckeanum* (2)

#### 1. *Rhaphidostichum aceastrostegium* (Sull.) Buck, comb. nov.

*Hypnum aceastrostegium* Sull., Proc. Amer. Acad. Arts & Sci. 5:287. 1861;  
*Sematophyllum aceastrostegium* (Sull.) Mitt., J. Linn. Soc., Bot. 12:  
 488. 1869; *Rhaphidostegium aceastrostegium* (Sull.) Jaeg., Ber. Tätigk. St.  
 Gallischen Naturwiss. Ges. 1876–77: 402. 1878; *Acroporium aceastroste-*  
*gium* (Sull.) Crum & Steere, Bryologist 59: 254. 1956.

*Rhaphidostegium helleri* Ren. & Card., Bull. Soc. Roy. Bot. Belgique 41(1):  
 95. 1905.

*Rhaphidostegium microtheca* Ren. & Card., Bull. Soc. Roy. Bot. Belgique  
 41(1): 96. 1905.

Smallish plants in thin, yellow- to reddish-green mats. Stems dark red, irregularly branched, the branches short, ascending. Stem and branch leaves somewhat differentiated, stem leaves entire to serrulate; branch leaves erect-spreading, 0.8–1.65 mm long, lanceolate to oblong-lanceolate, concave, abruptly long-acuminate, the apex often twisted; margins plane, serrate-serrulate in upper half; cells linear, flexuose, firm-walled, porose; alar cells 2–3 in each basal angle, oval or rarely  $\pm$  oblong, yellow to red-brown, enlarged, inflated. Autoicous; perichaetia on stems and bases of branches. Perichaetial leaves erect, ca. 1.5 mm long, oblong-lanceolate, abruptly acuminate; margins strongly serrate almost to base, more strongly so above; cells large, lax, thick-walled, colored in lower 1/3–1/4 of leaf; alar cells not differentiated. Setae ca. 1 cm long, smooth throughout, curved just below the urn; capsules inclined, short, 0.5–0.9 mm long; exostome teeth on front surface with a narrowly furrowed median line; endostome segments narrow, papillose, cilia single. Spores finely papillose, 11.5–17.5  $\mu$ m in diameter.

Range: Endemic to the West Indies; Cuba, Puerto Rico; mostly growing on rotten wood and tree trunks, rarely rocks. Previous reports from Hispaniola (Buck & Steere, 1983) are based on misdeterminations.

The species is immediately distinguishable under the dissecting microscope by the slender plants with leaf apices which appear as long, golden hair points. With higher magnification the apex is sharply serrate/serrulate and usually twisted. The plants are much smaller than *R. schwaneckeanum* and autoicous. However, a relationship is unmistakable. The furrowed exostome led to the species' placement in *Acroporium*, even though the leaves lack the characteristic channeled acumen of that genus.

2. RHAPHIDOSTICHUM SCHWANECKEANUM (C. Müll.) Broth., Nat. Pfl. ed. 2, 11: 435. 1925.

*Hypnum schwaneckeanum* C. Müll., Bot. Zeit. 16: 172. 1858; *Sematophyllum schwaneckeanum* (C. Müll.) Mitt., J. Linn. Soc., Bot. 12: 490. 1869; *Rhaphidostegium schwaneckeanum* (C. Müll.) Jaeg., Ber. Tätigk. St. Gallischen Naturwiss. Ges. 1876–77: 405. 1878; *R. schwaneckei* Kindb., Enum. Bryin. Exot. 33. 1888, nom. illeg.

*Leskea congesta* (Hedw.) Swartz var. *flavicans* Hampe, Linnaea 25: 362. 1853, nom. nud.

Medium sized to rather robust plants in yellow to golden, somewhat shiny, dense, small cushions. Stems creeping, red, freely but irregularly branched, the branches ascending, 1.0–1.5 cm long. Leaves erect, 1.75–2.5(–3.0) mm long, abruptly tapered from an oblong to oblong-ovate, concave base to a long, flat or twisted acumen, sometimes over half the leaf

length; margins plane, serrate above, serrulate almost to base; costa short and double; cells linear to linear-flexuose, slightly shorter in apex of acumen, incrassate and porose throughout; alar cells 3–5, subauriculate, enlarged, inflated, oblong-curved, hyaline, more than 10 times the size of the subquadrate ones above them, colored across the insertion. Dioicous. Perichaetial leaves erect, 1.5–2.1 mm long, lanceolate-triangular,  $\pm$  gradually acuminate, concave; margins plane, serrate almost to base; cells linear above, quadrate to hexagonal below, incrassate and porose throughout. Setae ca. 1.5 cm long, reddish, scabrous above; capsules inclined, ca. 1 mm long, ovoid-cylindric, with a prominent neck region; exostome teeth on front surface with a narrow furrow; endostome segments narrowly perforate, cilia mostly single, short. Spores papillose, 22–25  $\mu$ m in diameter.

Range: Endemic to the West Indies; Cuba, Puerto Rico, Guadeloupe, Martinique, St. Vincent; mostly growing on old wood.

*Rhaphidostichum schwaneckeanum* is an easy species to recognize by its abruptly tapered, serrate leaf apices. It might be confused with *R. acrostegium*, but it is much larger and dioicous. The plants seem to mostly occur in small cushions, usually not more than 2 cm in diameter. *Rhaphidostichum acrostegium* grows in much more extensive mats. Despite the size and growth-form differences, the leaf shape and toothing coupled with the large alar cells and furrowed exostome teeth argue strongly for a congeneric relationship.

### Excluded species

RHAPHIDOSTICHUM GUIANENSE BARTR., Bull. Torrey Bot. Club 66: 228. 1939.  
= *Sematophyllum galipense* (C. Müll.) Mitt.

RHAPHIDOSTICHUM GUNCKELII Thér., Revista Chilena Hist. Nat. 34: 258. 1930.  
 $\equiv$  *Sematophyllum gunckelii* (Thér.) Buck, **comb. nov.**

This species, based on Chilean material (*Gunckel s.n.*, 12. IX. 1929, isotype NY!), seems mostly closely related to *S. aberrans* (Broth.) Bartr., from the Juan Fernández Islands. I have not seen any material, however, and am basing my speculation on the description provided by Robinson (1975).

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### Literature Cited

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